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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/686,515

10/15/2003

Dimitri M. Donskoy

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03/09/2005

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EXAMINER

KWOK, HELEN C

ART UNIT

PAPER NUMBER

2856

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

E2

Office Action Summary

Application No.

10/686,515

Applicant(s)

DONSKOY ET AL.

Examiner

Helen C. Kwok

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-57 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/11/03</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 41-43 are objected to because of the following informalities. Appropriate correction is required.

In claim 41, line 1, the word "transmitter" should be changed to – transmitting – to provide proper antecedent basis.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-8, 10, 11, 15, 19-22, 25, 33, 38-41, 44, 45, 53-56 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 3,267,416 (Morse).

Morse discloses an ice profiling sonar system comprising, as illustrated in Figures 1-4, a first transmitter means 12 for transmitting a low frequency signal to a structure; a second transmitter means 13 for transmitting a high frequency probe signal to the structure; a receiver means (i.e. each of the transmitter 12,13 also function as a receiver and the circuitries receives the signal for computation) for receiving a modulated signal produced by the modulation of the high frequency signal by the low

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frequency signal responsive to the presence of ice on the structure. (See, column 2, line 9 to column 3, line 54).

With regards to claim 2, Morse further discloses a moving means (i.e. range unit 24,25); a trigger means 14 for triggering the transmission of the high frequency probe signal after the transmission of the low frequency signal.

With regards to claims 3-8, 10-11, 15, 19-22, 25, 33, 38-41, 44-45 and 53-56, the claims are commensurate in scope with the above claims and are rejected for the same reasons as set forth above. Furthermore, the probe signal appears as sideband spectral components for monitoring the amplitudes of the sideband components; the transmitter and receiver include an ultrasonic transmitter and ultrasonic receiver, respectively. (See, column 2, lines 54-72).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 9, 12-14, 16-18, 23-24, 26-32, 34-37, 42-43, 46-52 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 3,267,416 (Morse) in view of Publication titled "Nonlinear Acoustic Non-destructive Testing of Cracks" (Sutin).

With regards to claims 9, 12-14, 16-18, 23-24, 26-32, 34-37, 42-43, 46-52 and 57, Morse does not teach the claimed features in these claims. Sutin discloses a nonlinear acoustic non-destructive testing of cracks suggesting the claimed elements claimed in these claims. Sutin discloses the low frequency vibration signal is of a harmonic vibration produced or generated by the operation or the environment of the structure or a shaker or a hammer; the structure is of a wing of an aircraft; a piezoelectric transmitter and receiver; the frequency range is 10-30 kHz. It would have been obvious to a person of ordinary skill in the art at the time of invention to have readily recognize the advantages and desirability of employing the features as suggested by Sutin to the apparatus of Morse since these claimed features and/or characteristics are well known or is a mere design expedient in the art to an artisan of ordinary skill in the art to have readily recognize the advantages and desirability to provide new opportunities for detecting various defects in materials with high attenuation and reflection and utilizing a low frequency vibration coupled with a high frequency ultrasound has shown a sensitive diagnostic tool for detecting selective detections.

6. Claims 1-57 are rejected under 35 U.S.C. 102(a) or 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over either Publications titled "A Nonlinear Acoustic Technique For Crack And Corrosion Detection In Reinforced Concrete" (Donskoy et al.) or "Nonlinear Acoustic Non-destructive Testing Of Cracks" (Sutin) or "Nonlinear Acoustic Methods for Crack and Fatigue Detection" (Sutin et al.) or

"Variations of Acoustic Nonlinear Parameters With the Concentration of Defects in Steel" (Korotkov et al.) or "Nonlinear Vibro-acoustic Method For Diagnostics Of Metal" (Korotkov et al.) or "Modulation Of Ultrasound By Vibrations In Metal Constructions With Cracks" (Korotkov et al.).

All of the Publications disclose a nonlinear acoustic technique for detecting defects or anomalies comprising a first transmitter means for transmitting a low frequency signal to a structure; a second transmitter means for transmitting for transmitting a high frequency probe signal to the structure; a receiver for receiving a modulated signal produced by the modulation of the high frequency signal by the low frequency signal responsive to the presence of a defect or an anomaly on the structure; a moving means (i.e. range unit 24,25); a trigger means 14 for triggering the transmission of the high frequency probe signal after the transmission of the low frequency signal; sideband spectral components for monitoring the amplitudes of the sideband components; the transmitter and receiver include an ultrasonic transmitter and ultrasonic receiver, respectively wherein the low frequency vibration signal is of a harmonic vibration produced or generated by the operation or the environment of the structure or a shaker or a hammer; a piezoelectric transmitter and receiver; the frequency range is 10-30 kHz. Although the Publications teach detecting cracks, corrosion or fatigue in concrete, steel materials or pipeline, it would have been obvious to an artisan to use the apparatus for detecting ice on an aircraft wing since this is a mere intended use for the apparatus and it is well known to a person of ordinary skill in

the art to use acoustic techniques to detect the presence of ice on a wing of an aircraft, as evidenced by the references cited as prior art of record.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The references cited are related to ice detection on an aircraft wing.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen C. Kwok whose telephone number is (571) 272-2197. The examiner can normally be reached on 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

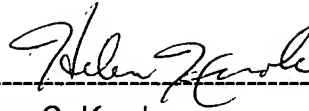
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in cursive script, reading "Helen C. Kwok", positioned above a horizontal dashed line.

Helen C. Kwok
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hck
March 2, 2005